Tactical Combat Casualty Care Performance Improvement

02 June 2014

Sources of TCCC Opportunities to Improve:

- **Reports from Joint Trauma System (JTS) weekly Trauma Telecons – every Thursday morning**
  - **Worldwide telecon to discuss every serious casualty admitted to a Role 3 hospital from that w**
- **Published medical rep**
- **Armed Forces Medical Examiner's System**
- **Theater AARs**
- **Feedback from doctors PAs, corpsmen, medi**

The Forgotten Tourniquet

The Forgotten Tourniquet

- **There was a recent adverse outcome from a tourniquet that was left in place for approximately 8 hours.**
- **Be aggressive about putting tourniquets on in Care Under Fire for any life-threatening extremity hemorrhage <u>BUT</u>**
- **Reassess the casualty in Tactical Field Care – remove it if it is not needed unless the casualty is in shock.**
- **<u>Always</u> re-evaluate tourniquets at two hours and remove if possible.**

Tourniquet Mistakes to Avoid!

- Not using a tourniquet when you should
- Using a tourniquet for minimal bleeding
- Leaving the TQ too high--if placed "high and tight" during Care Under Fire, move to just above the wound during TFC
- Not taking it off when indicated during TFC
- Taking TQ off when the casualty is in shock or has only a short transport time to the hospital
- Not making it tight enough – the tourniquet should both stop the bleeding and eliminate the distal pulse if the distal extremity is intact
- Not using a second tourniquet if needed
- Waiting too long to put the tourniquet on
- Periodically loosening the tourniquet to allow blood flow to the injured extremity

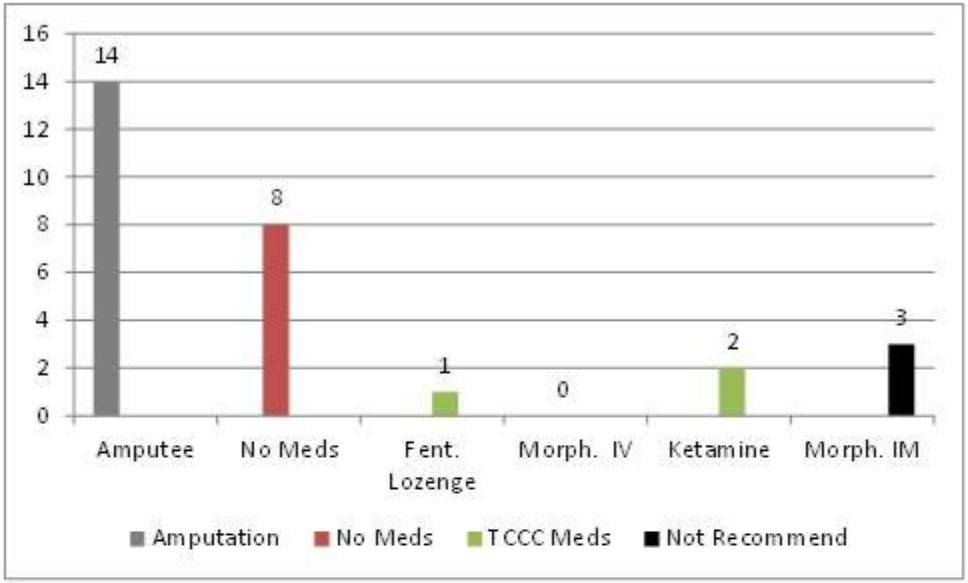
Opioid Analgesics for Casualties in Shock

NO Opioid Analgesia for Casualties in Shock

- **Narcotics** (morphine and fentan **CONTRAINDICATED** for casua who are in shock or who are lik go into shock; these agents may worsen their shock and increase the risk of death
- Four casualties in two successive weekly telecons were noted to have received narcotics and were in shock during transport or on admission to the MTFs
- **Use ketamine for casualties who are in shock or at risk of going into shock but are still having significant pain**

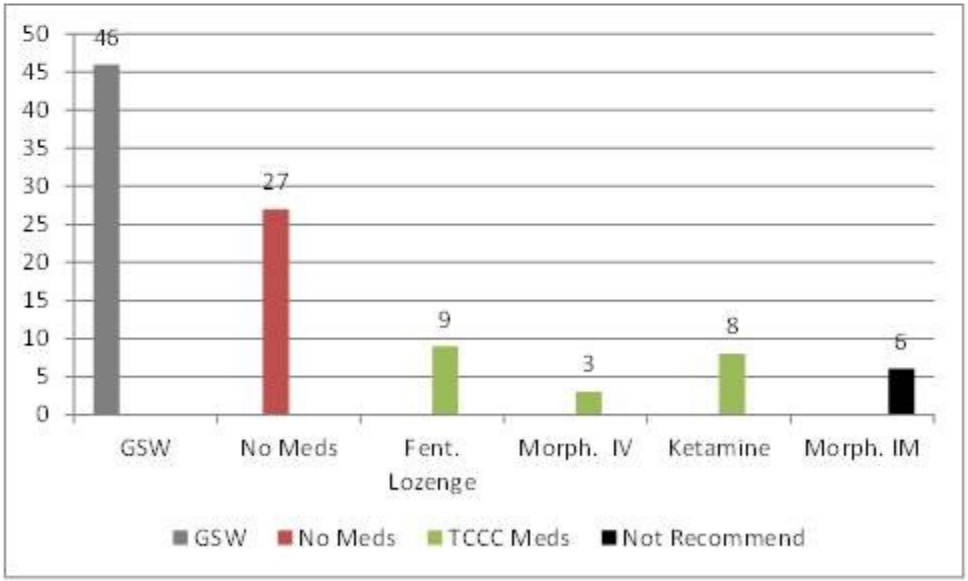
Untreated Pain on the Battlefield

Jul 2013- Feb 2014
N= 191 casualties
Prior to MEDEVAC



Amputations
57% no pain meds

- ***Slide courtesy of MAJ John Robinson***
- ***Data from JTS/JTTS TCCC AARs and PHTR***



GSW
59% no pain meds

**As of Dec 2013, 92% of line medics in USFOR-Afghanistan carry Morphine auto-injectors

Case Report

- **Male casualty with GSW to thigh**
- **Bleeding controlled by tourniquet**
- **In shock – alert but hypotensive**
- **Severe pain from tourniquet**
- **Repeated pleas to PA to remove the tourniquet**
- **PA did not want to use opioids because of the shock**
- **Perfect candidate for ketamine analgesia**
- **Ketamine not fielded at the time with this unit**

Opioid Analgesics Given in Combination with Benzodiazepines

Warning: Opioids and Benzos

- **Ketamine can safely be g**
  after a fentanyl lozeng
- **Some practitioners use**
  benzodiazepine medica
  such as midazolam to a
  ketamine side effects <u>BUT</u>
- **Midazolam may cause respiratory depression, especially when used with opioids**
- **<u>Avoid</u> giving midazolam to casualties who have previously gotten fentanyl**

Penetrating Eye Injuries

Penetrating Eye Trauma

- **Rigid eye shield for obvious or suspected eye wounds - often not being done – SHIELD AND SHIP!**
- **Not doing this may cause permanent loss of vision – use a shield for any injury in or around the eye**
- **Eye shields not always in IFAKs. Can use eye**
- **o + facial njury!**

Shield after injury

No shield after injury

Patched Open Globe

- **Shrapnel in right eye from IED**
- **Had rigid eye shield placed**
- **Reported as both pressure patched and as having a gauze pad placed under the eye shield without pressure**
- **Extruded uveal tissue (intraocular contents) noted at time of operative repair of globe**
- **Do not place gauze on injured eyes! COL Robb Mazzoli: Gauze can adhere to iris tissue and cause further extrusion when removed <u>even if no pressure is applied</u> to eye.**

Antibiotics after Eye Injuries

- **2010 casualty with endophthalmitis (blinding infection inside the eye)**
- **Reminder – shield and moxifloxacin in the field**

  for penetrating eye injuries – use combat pill pack!
- **Also –moxi, both topi**

  and systemically, sh

  be continued in MT
- **Many antibiotics do**

  penetrate well into t

  eye

Tension Pneumothorax

The Missed Tension Pneumothorax

ent U.S. combat fatality was found to have
d with a tension pneumothorax
vidence of attempted needle decompression
tor anyone with torso trauma or polytrauma
respiratory distress – perform needle
compression when indicated
AYS do bilateral NDC for a casualty with
so trauma who loses vital signs on the battlefie
his may be lifesaving

Combat Gauze

External Hemorrhage – No Combat Gauze

- **Casualty with gunshot wound in the left infraclavicular area with external hemorrhage**
- **“Progressive deterioration”**
- **External hemorrhage noted to increase as casualty resuscitated in ED**
- **<u>No</u> record of Combat Gauze use**
- **All injuries noted to be extrapleural**
- **Lesson learned: see following slide**

Combat Gauze

It doesn't work if you don't use it

Junctional Hemorrhage

Junctional Hemorrhage

recent U.S. combat casualty sustained a GSW to the inguinal area

he CASEVAC platform did not have junctional tourniquets aboard

he subsequent junctional hemorrhage was only partially controlled with Combat Gauze

asualty went into hemorrhagic shock and had be transfused

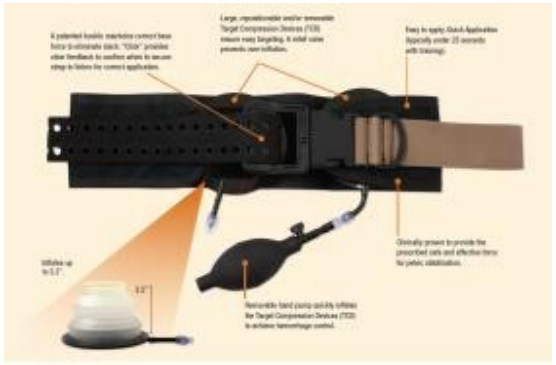
IED Blast Injury

- **3 of 5 casualties had complex blast injuries**
- **All 3 with high traumatic LE amputations and reported difficulty with hemorrhage control despite tourniquet use**
- **Combat Gauze reportedly not used**
- **All 3 would have been excellent candidates for a junctional tourniquet – none were fielded with this unit**
- **All 3 casualties required massive transfusions upon arrival at the Role 2 MTF**

Junctional Tourniquets

Combat Ready Clamp Junctional Tourniquet

JETT



Sam

Junctional tourniquets: They don't work if your unit doesn't field them

TCCC Training

TCCC Training for ALL combatants:

Self and buddy aid should be part of the Warrior Culture in all combat units

Eliminating Preventable Death on the Battlefield

otwal et al – Archives of Surgery 2011

l Rangers and docs trained in TCCC

S. military preventable deaths: 24%

nger preventable death incidence: 3%

most a 90% difference in preventable dea

Forces
Savage et al: Can J Surg

Conclusion

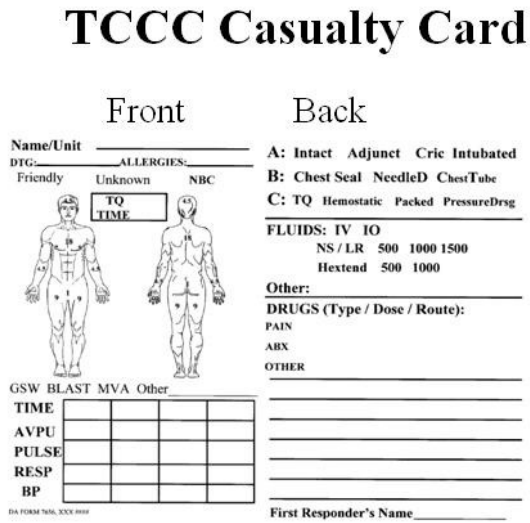
For the first time in decades, the CF has been involved in a war in which its members have participated in sustained combat operations and have suffered increasingly severe injuries. Despite this, the CF experienced the highest casualty survival rate in history. Though this success is multifactorial, the determination and resolve of CF leadership to develop and deliver comprehensive, multileveled TCCC packages to soldiers and medics is a significant reason for that and has unquestionably saved the lives of Canadian, Coalition and Afghan Security Forces. Further-

Train ALL Combatants in TCCC

- **Service medical departments are responsible for training combat medical personnel only**
- **Line commanders must take the lead to have an effective TCCC training program for *all* combatants**
- **Ranger Fi rse is the best mode**

Documentation of TCCC Care

TCCC Card – Fill It Out!


TCCC Casualty Card

Front

Name/Unit _____
DTG:_____ALLERGIES:_____
Friendly Unknown NBC
TQ TIME
GSW BLAST MVA Other_____
TIME
AVPU
PULSE
RESP
BP

Back

A: Intact Adjunct Cric Intubated
B: Chest Seal NeedleD ChestTube
C: TQ Hemostatic Packed PressureDrsg
FLUIDS: IV IO
NS / LR 500 1000 1500
Hextend 500 1000
Other:
DRUGS (Type / Dose / Route):
PAIN
ABX
OTHER
First Responder's Name_____

- **You haven't finished taking care of your casualty until this is done**
- **USFOR-A FRAGO 13-39 directs the use of the TCCC Casualty Card and electronic AAR**

New TCCC Card

TACTICAL COMBAT CASUALTY CARE (TCCC) CARD

BATTLE ROSTER #: _____

EVAC: ☐ Urgent ☐ Priority ☐ Routine

NAME (Last, First): _____ LAST 4: _____

GENDER: ☐ M ☐ F DATE (DD-MMM-YY): _____ TIME: _____

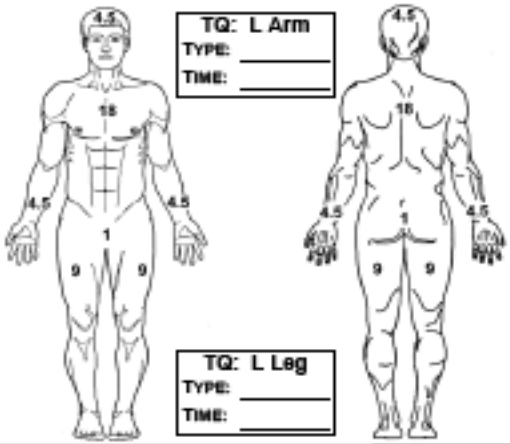
SERVICE: _____ UNIT: _____ ALLERGIES: _____

Mechanism of Injury: (X all that apply)

☐ Artillery ☐ Blunt ☐ Burn ☐ Fall ☐ Grenade ☐ GSW ☐ IED
☐ Landmine ☐ MVC ☐ RPG ☐ Other: _____

Injury: (Mark injuries with an X)

TQ: R Arm	TQ: L Arm
TYPE: _____	TYPE: _____
TIME: _____	TIME: _____



TQ: R Leg	TQ: L Leg
TYPE: _____	TYPE: _____
TIME: _____	TIME: _____

Signs & Symptoms: (Fill in the blank)

Time				
Pulse (Rate & Location)				
Blood Pressure	/	/	/	/
Respiratory Rate				
Pulse Ox % O2 Sat				
AVPU	▾	▾	▾	▾
Pain Scale (0-10)	▾	▾	▾	▾

DD Form 1380, NOV 2013 TCCC CARD

BATTLE ROSTER #: _____

EVAC: ☐ Urgent ☐ Priority ☐ Routine

Treatments: (X all that apply, and fill in the blank)

C: TQ- ☐ Extremity ☐ Junctional ☐ Truncal — *Type* _____
Dressing- ☐ Hemostatic ☐ Pressure ☐ Other _____
A: ☐ Intact ☐ NPA ☐ CRIC ☐ ET-Tube ☐ SGA _____
B: ☐ O2 ☐ Needle-D ☐ Chest-Tube ☐ Chest-Seal _____

C:

	Name	*Volume*	*Route*	*Time*
Fluid			▾	
			▾	
Blood Product			▾	
			▾	

MEDS:

	Name	*Dose*	*Route*	*Time*
Analgesic (e.g., Ketamine, Fentanyl, Morphine)			▾	
			▾	
			▾	
Antibiotic (e.g., Moxifloxacin, Ertapenem)			▾	
			▾	
Other (e.g., TXA)			▾	
			▾	

OTHER: ☐ Combat-Pill-Pack ☐ Eye-Shield (☐ R ☐ L) ☐ Splint
☐ Hypothermia-Prevention Type: _____

NOTES:

FIRST RESPONDER
NAME (Last, First): _____ LAST 4: _____

DD Form 1380, NOV 2013 (Back) TCCC CARD

New TCCC AAR

MEDICAL RECORD-SUPPLEMENTAL MEDICAL DATA
For use of this form, see AR 40-66; the proponent agency is the Office of the Surgeon General

REPORT TITLE
TACTICAL COMBAT CASUALTY CARE-AFTER ACTION REPORT
JTS APROVED (Date) (20140128) -V3.0

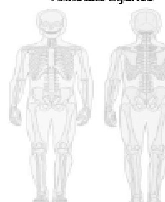
Event: Date ____ Time ____ Country ____ AOR/Region ____

Battle Injury ☐ WIA ☐ KIA ☐ Care Under Fire ☐ Tactical Field Care ☐ Company/BAS Care | Non Battle Injury ☐ Alive ☐ Dead

Mechanism
- ☐ Aircraft Crash
- ☐ Blast – Dismounted
- ☐ Blast – Mounted
- ☐ Blast – RPG or Grenade
- ☐ Blast – Indirect Fire (Mortar/Artillery)
- ☐ Blast – Other
- ☐ Blunt
- ☐ Collapse / Crush from Structure
- ☐ Environmental ____
- ☐ Fall, Height ____ ft
- ☐ Fragmentation (shrapnel)
- ☐ Gun Shot Wound
- ☐ Motor Vehicle Crash
- ☐ Parachute Landing Fall ☐ Malfunction
- ☐ Other ____

Injuries
- ☐ Amputation
- ☐ Burn, TBSA ____%
- ☐ Crepitus
- ☐ Deformity
- ☐ Degloving
- ☐ Fracture
- ☐ Gun Shot Wound
- ☐ Hematoma
- ☐ Laceration
- ☐ Peppering
- ☐ Puncture
- ☐ TBI (suspect)
- ☐ Other ____

Annotate Injuries



Signs — GCS: Eyes 1-4; Verbal 1-5; Motor 1-6 — Pain: 0-10

Time										
First	HR	BP /	RR	pOx	AVPU	Eyes	Verbal	Motor	Pain
	HR	BP /	RR	pOx	AVPU	Eyes	Verbal	Motor	Pain
	HR	BP /	RR	pOx	AVPU	Eyes	Verbal	Motor	Pain
Last	HR	BP /	RR	pOx	AVPU	Eyes	Verbal	Motor	Pain

Circulation - Hemorrhage Control (NM: Non-medic, M: Medic, MO: Medical Officer)
- Time ☐ NM ☐ M ☐ MO ☐ TQ-CAT ☐ TQ-SOFTT ☐ TQ-Other ____ ☐ RUE ☐ LUE ☐ RLE ☐ L
- Time ☐ NM ☐ M ☐ MO ☐ TQ-CAT ☐ TQ-SOFTT ☐ TQ-Other ____ ☐ RUE ☐ LUE ☐ RLE ☐ L
- Time ☐ NM ☐ M ☐ MO ☐ TQ-CAT ☐ TQ-SOFTT ☐ TQ-Other ____ ☐ RUE ☐ LUE ☐ RLE ☐ L
- Time ☐ NM ☐ M ☐ MO ☐ TQ-CAT ☐ TQ-SOFTT ☐ TQ-Other ____ ☐ RUE ☐ LUE ☐ RLE ☐ L
- ☐ NM ☐ M ☐ MO ☐ TQ-Multiple to the same extremity, Type & Exts
- ☐ NM ☐ M ☐ MO ☐ TQ-Junctional, Type & Region
- ☐ NM ☐ M ☐ MO ☐ Hemostatic Dressing, Type
- ☐ NM ☐ M ☐ MO ☐ Pressure Dressing, Type
- ☐ NM ☐ M ☐ MO ☐ Other Dressing, Type
- ☐ NM ☐ M ☐ MO ☐ Splint, Type

Airway — Time — Type
- ☐ NM ☐ M ☐ MO ☐ NPA-Nasopharyngeal Airway
- ☐ NM ☐ M ☐ MO ☐ Cric-Cricothyroidotomy
- ☐ NM ☐ M ☐ MO ☐ ET-Endotracheal Tube
- ☐ NM ☐ M ☐ MO ☐ King LT ☐ LMA ☐ Other

PREPARED BY (Name, Rank & Title) | DEPARTMENT/SERVICE/CLINIC (Treating Unit) | DATE

PATIENT'S IDENTIFICATION (Name: last, first, middle; grade; date; hospital or medical facility)
Last Name ____ First Name ____ MI ____
BR# ____ Rank ____ Unit ____
SSN ____ DOB ____ Gender ☐ M ☐ F

☐ HISTORY/PHYSICAL ☒ TREATME
☐ DIAGNOSTIC STUDIES ☐ FLOW CH
☐ OTHER EXAMINATION OR EVALUATION
☐ OTHER, Specify

DA FORM 4700, FEB 2003 EDITION OF MAY 78 IS OBSOLETE. JOINT TRAUMA SYSTEM OP 03 (MCMR-SRJ) JAN 2014 APD PE v1

MEDICAL RECORD-SUPPLEMENTAL MEDICAL DATA
For use of this form, see AR 40-66; the proponent agency is the Office of the Surgeon General

REPORT TITLE
TACTICAL COMBAT CASUALTY CARE-AFTER ACTION REPORT *Page 2, continued*
JTS APROVED (Date) (20140128) -V3.0

Time — NM: Non-medic, M: Medic, MO: Medical Officer — **Breathing** — Type & Location
- ☐ NM ☐ M ☐ MO ☐ Chest Seal(s)
- ☐ NM ☐ M ☐ MO ☐ Needle Chest Decompression ☐ Right ____ ☐ Left ____
- ☐ NM ☐ M ☐ MO ☐ Chest Tube ☐ Right ____ ☐ Left ____
- ☐ NM ☐ M ☐ MO ☐ Bag Valve Mask

Circulation - Resuscitation
- ☐ NM ☐ M ☐ MO ☐ Saline Lock
- ☐ NM ☐ M ☐ MO ☐ IO-Intraosseous Device, Type
- ☐ NM ☐ M ☐ MO ☐ IV Fluids, Type
- ☐ NM ☐ M ☐ MO ☐ IV Hextend
- ☐ NM ☐ M ☐ MO ☐ FDP-Freeze Dried Plasma
- ☐ NM ☐ M ☐ MO ☐ TXA-Tranexamic Acid

Additional Interventions
- ☐ NM ☐ M ☐ MO ☐ Eye Shield ☐ Protective Eyewear ☐ Right
- ☐ NM ☐ M ☐ MO ☐ C-Collar ☐ Spine Board ☐ Pelvic Binder, T
- ☐ NM ☐ M ☐ MO ☐ Hypothermia Prevention, Product
- ☐ NM ☐ M ☐ MO ☐ Hypothermia Prevention, Product

Medications
- ☐ NM ☐ M ☐ MO Combat Wound Pill Pack
- ☐ NM ☐ M ☐ MO Drug
- ☐ NM ☐ M ☐ MO Drug
- ☐ NM ☐ M ☐ MO Drug
- ☐ NM ☐ M ☐ MO Drug
- ☐ NM ☐ M ☐ MO Drug
- ☐ NM ☐ M ☐ MO Drug
- ☐ NM ☐ M ☐ MO Drug
- ☐ NM ☐ M ☐ MO Drug

Evacuation ☐ Urgent ☐ Priority ☐ Routine
- ☐ Aircraft, Airframe (i.e., UH-60)
- ☐ Ground Vehicle Type
- ☐ Litter Type
- ☐ Manual Carry Type

Narrative Summary of Care

Provider Information — Last Name
- NM - Non-Medic First Responder
- M - Medic
- MO - Medical Officer

PREPARED BY (Signature & Title) | DEPARTMEN

PATIENT'S IDENTIFICATION (Name: last, first, middle; grade; date; hospital or medical facility)
Last Name ____ First Name ____
BR# ____ Rank ____ Unit ____
SSN ____ DOB ____ Gender ☐ M ☐ F

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TACTICAL COMBAT CASUALTY CARE-AFTER ACTION REPORT
Page 3, continued
IAW AR 40-68 (RAR) 22 May 2009 Paragraph 3–7. This page is a quality assurance document. Do not file in medical records.

CASUALTY'S PROTECTIVE EQUIPMENT *(Check all worn)*

☐ Helmet, Ballistic	☐ Neck Protector (Back)	☐ Deltoid Right	☐ Plate Back	☐ Blast Gauge	☐ Pelvic Undergarment
☐ Tactical Vest (IOTV)	☐ Throat Protector (Front)	☐ Deltoid Left	☐ Plate Right Side	☐ Blast Sensor Helmet	☐ Eye Protection
☐ Plate Carrier (Only)	☐ Groin Shield	☐ Plate Front	☐ Plate Left Side	☐ Blast Sensor Other	☐ Ear Protection

AAR Discussion Event Date ____ ☐ Tactical situation complicated care *(Explain in discussion)*

Sustains	Improves

PATIENT'S IDENTIFICATION (Name: last, first, middle; grade; date; hospital or medical facility)
Last Name ____ First Name ____ MI ____
BR# ____ Rank ____ Unit ____
SSN ____ DOB ____ Gender ☐ M ☐ F
Date ____

Questions?